sorensen systems

Single-Source System Provider

Water-to-Wire, Turbine-Valve-Controls Integration,
Motion & Control Engineered Systems

Sorensen Systems Selected as Hydroturbine System Vendor for Granville Pipeline Project

Sorensen Systems was designated as the Hydroturbine System Vendor by the City of Westfield, MA, to design, supply, install, test, start-up and commission a packaged hydropower turbine and generator system complete with electrical controls and instrumentation as part of a large pipeline replacement project located in Southwick, MA. The Granville Pipeline Project was established to replace the aging existing pipeline to include the installation of a new Hydroturbine producing 37 kW, which is roughly equal to the plant's power consumption.

In-Conduit Energy Recovery

Similar to over 600 public water systems in Massachusetts, the Granville Pipeline project was a candidate for the installation of an in-conduit energy recovery platform that has become an important part of Sorensen System's capabilities. The components of the system include a skid-mounted turbine/generator, a hydraulically operated turbine isolation valve, a hydraulic power unit, and a turbine generator control panel. The system has a remote OIT display panel located in the Hydroturbine room.

Hydro generation at public water systems and publicly owned treatment plants offer significant advantages over traditional hydropower projects for several reasons. First, because the system already exists and is not being built from scratch, conduit exemptions are able to be used and the permitting process is more streamlined. Second, according to published reports, the value of energy generated indicates an average of 50 percent less than the typical current per kilowatt rate paid for electricity used at the treatment facilities. Finally, conduit hydropower facilities are not subject to the hydrologic cycle, as flow is a function of plant operation and demand, reducing unpredictable periods of low generation.

System Design Specifications

The turbine/generator was designed to be skid-mounted. It consisted of a 37 kW rated horizontal turbine with coupling and guard. The system included a six inch Class 125 flanged turbine interconnection spool assembly, turbine inlet and outlet pressure transducers, and a Marathon Electric, 37 kW, 480 VAC, 3PH, 60Hz, 1200 RPM, open drip proof induction generator.

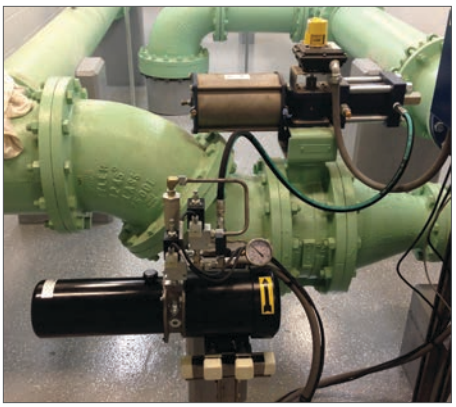
The system included a hydraulic operated turbine isolation valve which consisted of a six inch AWWA C504 Class 125 rubber seated butterfly valve, cast iron body, ductile iron disc, stainless steel disc edge, stainless steel shaft, and a hydraulic operated spring closing rotary actuator. The hydraulic power unit was self-contained with a control valve assembly. And the turbine generator control panel includes an Allen Bradley PLC based control system, control power circuit breakers, 24 VDC power supplies, Ethernet switch to interface with the existing SCADA system, control switches, and multifunction protection relay.

Rising Water Rates

In 2011, tropical storm Irene collapsed the Granville spillway and dam with damage totaling nearly $3 million. Replacing the pipeline and installing the Hydroturbine system was another nearly $3 million. The newspapers reported that water rates for Westfield, MA, were predicted to rise 50 to 70 percent in the next five years as all estimated costs could reach $10 million. Any and all efforts to reduce operating costs for the operation of water treatment plants through the use of in-conduit energy recovery becomes more important every day.

Granville Pipeline Replacement
The City of Westfield had a requirement to replace a collapsed raw water transmission pipeline which flows by gravity to the city.

Hydropower Turbine
Sorensen Systems was engaged to design, supply, install, test, startup and commission a packaged hydropower turbine and generator system.



In-Conduit Energy Recovery
The Granville Pipeline and Hydroturbine installation for the City of Westfield will take advantage of in-conduit energy recovery to supply up to 37 kW.

ISO 9001:2008 Certified
UL 508A Panel Shop

Sorensen Systems
70 Bearfoot Road
Northborough, MA 01532

Tel: 508-393-7660
Fax: 508-393-6042
www.SorensenSystems.com